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Functional outcomes of child and adolescent mental disorders. Current disorder most important but psychiatric history matters as well

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Abstract

Background: Various sources indicate that mental disorders are the leading contributor to the burden of disease among youths. An important determinant of functioning is current mental health status. This study investigated whether psychiatric history has additional predictive power when predicting individual differences in functional outcomes.

Methods: We used data from the Dutch TRAILS study in which 1778 youths were followed from preadolescence into young adulthood (retention 80%). Of those, 1584 youths were successfully interviewed, at age 19, using the World Health Organization Composite International Diagnostic Interview (CIDI 3.0) to assess current and past CIDI-DSM-IV mental disorders. Four outcome domains were assessed at the same time: economic (e.g., academic achievement, social benefits, financial difficulties), social (early motherhood, interpersonal conflicts, antisocial behavior), psychological (e.g., suicidality, subjective well-being, loneliness), and health-behavior (e.g., smoking, problematic alcohol, cannabis use).

Results: Out of the 19 outcomes, 14 were predicted by both current and past disorders, 3 only by past disorders (receiving social benefits, psychiatric hospitalization, adolescent motherhood), and 2 only by current disorder (absenteeism, obesity). Which type of disorders was most important depended on the outcome. Adjusted for current disorder, past internalizing disorders predicted in particular psychological outcomes while externalizing disorders predicted in particular health behavior outcomes. Economic and social outcomes were predicted by a history of comorbidity of internalizing and externalizing disorder. The risk of problematic cannabis use and alcohol consumption dropped with a history of internalizing disorder.

Conclusion: To understand current functioning, it is necessary to examine both current and past psychiatric status .

Keywords: Youth Mental health; Psychiatric history; Mental Disorders; Functional Outcomes; Development; Participation; Comorbidity; Adolescence

INTRODUCTION

About 25% of the disease burden in terms of disability-adjusted life years (DALYs) can be attributed to mental disorders (Vos et al., 2000, 2001). Among youths between age 10 to 24, mental disorders are the leading contributor to the burden of disease (Harhay & King, 2012; Vos et al., 2000, 2001). The first onset of psychiatric disorders often occurs in childhood and adolescence, and the lifetime prevalence of diagnosable disorders increases substantially during adolescence (Copeland et al., 2011; Costello et al., 2003; Merikangas et al., 2010a; Ormel et al., 2014; Wittchen et al., 1998). The increase in the incidence of disability due to mental disorder during adolescence is nearly fivefold (Vos & Mathers, 2000), which creates a poor starting position to enter adulthood for affected adolescents. Adequate functioning at the time of entry into adulthood is important, given the developmental challenges that lie ahead: staying healthy and maintaining an acceptable quality of life, avoiding risky behaviors, completing one's education, getting and maintaining a job, developing a social support network, avoiding or desisting illegal behavior, finding and maintaining a partner and starting a family. Some of the disease burden caused by mental disorders is due to relatively rare (<1%) but very impairing chronic disorders (e.g., schizophrenia and autism), but the largest proportion is due to common mental disorders and subclinical emotional and behavioral problems.

Whereas multiple studies among youth have documented that mental health status is an important cross-sectional determinant of functioning (e.g., Costello, 1999; Fergusson & Horwood, 2001; Fergusson & Woodward, 2002; Quinton et al., 1995; Rutter et al., 1997; Verboom et al., 2013), less is known about the *additional* influence of psychiatric history on current functioning (Copeland et al., 2015; Fergusson et al., 2013). Based on data from the Great Smoky Mountains Study, Copeland and colleagues (2015) reported that childhood and adolescent mental disorders, even if not persisting into adulthood, were associated with a disrupted transition to adulthood, as indexed by one or more adverse outcomes related to health, the legal system, personal finances, and social functioning in young adulthood. Copeland and colleagues defined cases as individuals that met clinical criteria for a psychiatric disorder at any given time during their youth. They distinguished neither between types of disorder nor between ages of onset.

The study reported herein sought not only to replicate the findings of Copeland and colleagues with regard to the relevance of psychiatric history for current functioning, but also to expand those findings by additionally investigating the potential influence of type of disorder (internalizing versus externalizing) and age of onset (childhood versus adolescence). Both aspects are important. Internalizing and externalizing disorders are likely to impact different outcomes, and early onset disorders may have more severe consequences compared to later onset disorders. Substantial differences in mean age of onset do exist between disorders, with relatively early ages of onset for specific phobia, ADHD, and separation anxiety and behavior disorders, whereas most other anxiety disorders, mood disorders, and substance dependence, typically develop after the transition into adolescence (Ormel, Raven, & Oldehinkel, 2014). Thus, the present study aimed to examine whether psychiatric history explains variation in functioning at age 19 -the time of entry in adulthood- over and above current mental health status in a representative Dutch population sample of 2230 youths. More specifically, we focused on a broad array of functioning indicators in economic, social, psychological and health behavior domains; and related these indicators to not only current mental health status but also to psychiatric history, taking into account the number of lifetime disorders, comorbidity of internalizing and externalizing disorders, and the age of onset of the disorders.

METHODS

Sample and procedure

The TRacking Adolescents' Individual Lives Survey (TRAILS) is a prospective cohort study of Dutch adolescents using bi- or triennial measurements from age 11 onward. Its aim is to chart and explain the development of mental health from preadolescence into adulthood. Previous publications have extensively described its design, methods, response rates and bias (de Winter et al., 2005; Huisman et al., 2008; Nederhof et al., 2012; Oldehinkel et al., 2015; Ormel et al., 2012). The study was approved by the Dutch Central Committee on Research Involving Human Subjects (CCMO; www.ccmo.nl).

Briefly, participants were selected from five municipalities in the North of the Netherlands, both urban and rural, including the three largest cities. Children born between 1 October, 1989 and 30 September, 1991 were eligible for inclusion, providing they met the inclusion criteria and their schools were willing to participate (de Winter et al., 2005). Over 90% of the schools, enrolling a total of 2935 eligible children, agreed to participate in the study. Through extended efforts, 76% of these children and their parents consented to participate (T1, $n = 2230$, mean age = 11.1 years, $SD = 0.6$, 51% girls). Subsequent data collection waves took place bi- or triennially, and had good retention rates (T2 mean age 13.6; 96%; T3 16.3, 81%; T4 19.1, 84%).

Measures

Diagnostic assessment. The presence of lifetime mental health disorders was assessed at age 19 (T4) using the Composite International Diagnostic Interview (CIDI) 3.0. The CIDI is a structured diagnostic interview that has been used in multiple surveys worldwide to generate diagnoses based on the DSM-IV (Kessler & Ustun, 2004). Clinical calibration studies found its assessment of disorders to be generally valid in comparison to blinded clinical reappraisal interviews using the Structured Clinical Interview for DSM-IV (SCID) (Haro et al., 2006; Kessler et al., 2004; Kessler et al., 2009). CIDI-based prevalence estimates were typically comparable to SCID-based prevalence estimates, except for specific phobias and oppositional defiant disorders, for which CIDI estimates were higher.

The assessment included mood disorders (major depressive disorder, dysthymic disorder, and bipolar disorder I and II), anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder, separation anxiety disorder, and obsessive compulsive disorder), behavior disorders (attention-deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder), and substance dependence (alcohol dependence and drug dependence). The interview was administered by trained lay-interviewers. Of the total sample, 1584 adolescents (84% of T4 sample, mean age 19.3 years, 54% girls) provided CIDI data (Ormel et al., 2014).

Predictors: current mental health status and psychiatric history.

We constructed several predictor variables based on CIDI data. First, we determined current mental health status based on T4 CIDI data. We created two continuous predictor variables representing the total number of internalizing (i.e., mood and anxiety disorders combined) and externalizing (i.e., behavior disorders and substance use dependence combined) mental health disorders that were present (i.e., non-remitted) at age 19 (T4), according to the 1-month prevalence data. Second, we created two continuous diagnostic history variables representing the total number of internalizing and externalizing disorders a person had prior to T4, thus excluding all disorders with 1-month point prevalence at T4. Third, we determined separately for the domains of internalizing and externalizing disorders, whether or not the onset was in young childhood (i.e., onset before age 11y, T1) or in adolescence (i.e., onset between age 11y and 18y). We created two dichotomous variables representing onset (0 = childhood, 1 = adolescence) of internalizing and externalizing disorders. See Figure 1 for a detailed overview

of the sample.

[Insert Figure 1 about here]

Young adult functional outcomes. Table 1 describes the 19 economic, social, psychological and health functioning outcomes assessed at age 19y (T4). Most outcomes refer to T4, some to the 3 months preceding T4.). Outcomes measured at ordinal or interval level were analyzed as binary variables, dichotomized in a manner that set apart -as much as possible- the 10% of young adults with relatively poor outcomes. We choose 10% because the prevalence of a definite case of any DSMIII-R diagnosis in Dutch adolescents is 8% (Verhulst et al., 1997). Table 1 summarizes the outcomes and their measurement, the definition of the poor outcome category and its frequency.

[Insert Table 1 about here]

Statistical analysis

We first calculated some descriptive information on the prevalence, recency, and onset of lifetime mental health disorders in our sample. Then, to examine the association between CIDI-based current and past mental disorders on the one hand, and young adult economic, social, psychological and health functioning outcomes on the other, we conducted several multiple logistic regression analyses, with the binary T4 outcome variables (as described in Table 1) as dependent variables. First we tested whether current mental health status significantly predicts T4 functioning (step 1). Second, we tested whether a history of internalizing and/or externalizing disorders prior to T4 predicted T4 functioning, above and beyond the effect of current diagnostic status (step 2). Third, we examined the predictive effect of age-of-onset (childhood vs. adolescence) on T4 functioning in those individuals in which a history of mental health disorder significantly predicted T4 outcome. We ran separate binary regression analyses for onset of internalizing and externalizing variables. Pearson correlations were calculated between the predictor variables.

RESULTS

Descriptives

We found an overall lifetime prevalence of CIDI-DSM-IV disorders of 44.4 % (n=704). Out of the 1584 participants with CIDI data, 305 participants (29.2%) were diagnosed at T4 with a current mental health disorder in the past month (1-month prevalence at T4), whereas 399 were disorder-free (remitted) at T4 (25.2%), and 880 never had a lifetime mental health disorder (55.6%). See further Figure 1. For more information on prevalence, severity, age of onset, continuity and co-morbidity of DSM disorders, please see Ormel et al. 2015.

Less than 5% of the data was missing for all T4 outcome variables, except frequent absenteeism (9.5%) and recent psychiatric hospitalization (12.9%). Information on psychiatric hospitalization was received through data linkage with psychiatric case registry data (fully described in (Jörg et al., 2015), for which not all participants had given informed consent), which explains the larger proportion of missing data for this variable.

Association between psychopathology and early adult functioning

Table 2 shows the correlations among the predictors. Tables 3a-d show the Odds Ratio's (ORs) for each of the predictors for economic, social, and psychological functioning and health behavior outcomes. Overall, both current and past disorders seem important as 14 of the 19 outcomes were predicted by both current and past disorders, 3 only by past disorders (receiving social benefits, psychiatric hospitalization, adolescent motherhood), and 2 only by current disorder (absenteeism, obesity).

[Insert Table 2 about here]

[Insert Tables 3a-d about here]

Economic functioning. The ORs in Table 3a show that current mental health status significantly predicts economic outcome. Individuals with mostly externalizing disorders are at increased risk of having attained a lower educational level, receiving social benefits, being frequently absent from work and/or school, and of having financial difficulties. Adding psychiatric history to the model, both a history of internalizing and externalizing significantly increased the odds of a low educational level and receiving social benefits, over and above the effect of current disorder. For social benefits, the effects of current disorder even became non-significant after including psychiatric history in the model. A history of internalizing disorders additionally increased the odds of having financial difficulties, over and above the effect of current externalizing disorders. Psychiatric history did not significantly predict recent frequent absenteeism from work or school. No differences were observed for the effects of childhood versus adolescent onset disorders on economic functioning.

Social functioning. The ORs in Table 3b show that current externalizing disorders significantly increased the risk of antisocial behavior, let down experiences, interpersonal conflicts and physical assaults (including rape). Adolescents with current internalizing disorder were also more likely to experience letdowns compared to adolescents without current internalizing disorder. Further, a history of internalizing and externalizing disorder significantly increased the odds of poorer social outcomes above and beyond the effect of current, largely externalizing disorders. Early motherhood was (understandably) not predicted by current disorder, but adolescents with a history of internalizing and externalizing disorders were at increased risk of becoming a parent before the age of 18/19. Onset of the disorders did not significantly add to the prediction of these social outcomes.

Psychological functioning. Particularly a history of internalizing disorders increased the odds of poor psychological outcomes, including unhappiness or dissatisfaction with life, sleep problems, and loneliness, above and beyond the effects of current internalizing disorders (Table 3c). Both history and current internalizing and externalizing disorders increased the odds of using specialized mental health care. Psychiatric hospitalization was not predicted by current diagnostic status, but adolescents with a history of internalizing and/or externalizing disorders were at increased risk of being recently hospitalized. Individuals with a history of internalizing disorders with an onset in adolescence were more likely to feel lonely compared individuals with childhood-onset internalizing disorders.

Health behaviors. A history of externalizing (but not internalizing) disorders significantly increased the odds of frequent smoking, and problematic alcohol and cannabis use, but not obesity, in addition to the effects of current externalizing disorders on these outcomes (Table 3d). Particularly individuals with a history of externalizing disorders with an onset in adolescence were more likely to frequently smoke compared to individuals with childhood-onset externalizing disorders. In contrast, individuals with current internalizing disorders were less likely to use alcohol in a problematic manner than individuals without mental health disorders. A history of internalizing disorders did not add to the prediction of problematic alcohol use.

DISCUSSION

The study reported herein sought to examine whether psychiatric history, in terms of internalizing versus externalizing disorder and age of onset, explains additional variation in functioning at age 19 -the time of entry in adulthood- over and above current mental health status. The answer is definitely yes. Out of the 19 outcomes, 14 were predicted by both current and past disorders, 3 by only past disorders, and 2 by only current disorder (absenteeism). If history matters, which type of past disorders is most important depends on the nature of the outcome studied. Adjusted for current disorder, past internalizing disorders predicted in particular psychological outcomes while externalizing disorders predicted in particular health behavior outcomes. Economic and social outcomes were predicted by a

history of comorbidity of internalizing and externalizing disorder. The risk of problematic cannabis use and alcohol consumption dropped with a history of internalizing disorder. Strength of effects depended on the specific outcome as well. In general, ORs waxed and waned around 2.0 for the multi-categorical predictors (e.g., current # disorders, past # internalizing disorders). An OR of 2.0 indicates that for each extra disorder, the risk of a maladaptive outcome doubles. As noted by Copeland and colleagues (2015), it is not surprising that psychiatric history is associated with functional status. What is surprising is a) that these effects are still found after adjustment for current mental health status, and b) that they hold for a broad variety of economic, social, psychological, and health behavior outcomes.

For various reasons, our findings do not provide causal evidence that past disorders cause poor outcomes. First, we cannot exclude the possibility that the higher rate of poor outcomes in youth with a history of mental disorder is a consequence of unmeasured risk factors influencing both mental health and life outcomes. Earlier work showed that confounding by preadolescent IQ, temperament and parental SES is very limited (Ormel et al., unpublished). The second (related) reason limiting causal interpretation is the possibility that particular poor outcomes may be the result of a trajectory of prior events and experiences that as such may have influenced the development of childhood and adolescent psychopathology. For example, poor academic achievement may well have been preceded by systematic underachievement in secondary school, which in turn may have contributed to the development or worsening of psychopathology, due to the stress and events related to this lack of achievement.

Strengths and limitations

Strengths of this study include its well-documented sample of adolescents, followed from preadolescence to early adulthood, consideration of comorbidity, age of onset, and the breadth of outcomes. One limitation is that, despite moderate non-response at baseline and limited attrition at follow-ups, both were not random. CIDI non-response was predicted by male gender, non-Western ethnicity, low SES, low IQ and academic achievement, poor physical health, and behavior and substance use problems (Nederhof et al., 2012). However, non-response bias in psychiatric epidemiological studies tends to be conservative, with actual associations between psychopathology and functional outcomes often being stronger, especially for behavior disorders and substance dependence (Eaton, Kessler, Wittchen, & Magee, 1994; Kessler, Chiu, Demler, & Walters, 2005; Merikangas et al., 2010b).

Concluding comments

Economic, social, and psychological functioning and health behavior during the transition into adulthood is predicted not only by current mental disorder but also -and about as strongly- by psychiatric history. This suggests that at least part of the disadvantage has occurred long before the transition into adulthood and that disorder remission has not resulted in catching up completely. The risk of relatively poor functional outcomes tends to double with each additional past disorder. In turn, these functional limitations may increase future risk of mental disorder, disability, and loss of quality of life (Moffitt et al., 2011).

It is well established that childhood and adolescent mental disorders are costly, impairing, and often a burden for all involved, especially the child/adolescent and family (Costello et al., 1996, 2007). Many youth will experience mental health problems during their pre-adult years. As observed in different longitudinal studies, these common early disorders are often associated with a disrupted transition to adulthood, even if the disorders remit before adulthood (Copeland et al., 2015; Fergusson et al., 2013). Earlier we reported that about 5% of all youth suffer from pervasive concurrent and sequential comorbidity as indexed by at least three lifetime disorders from at least three major diagnostic domains. We coined this

“generalized” psychopathology (Ormel et al., 2014). These 5% seem especially at risk of poor future outcomes.

Collectively, the findings strongly stress the need to improve prevention and treatment of mental disorder in childhood and adolescence, especially “generalized” psychopathology rather than single disorders (Weisz et al., 2005). If effective in the long term, early treatment and prevention will decrease the burden of pre-adult psychopathology and benefit a more successful transition to adulthood. We fully endorse Copeland’s statement that “If the goal of public health efforts is to increase opportunity and optimal outcomes, and to reduce distress, then there may be no better target than the reduction of childhood psychiatric distress—at the clinical and subthreshold levels” (Copeland et al., 2015, p.898)

Conflict of Interest

Dr. Verhulst is a contributing author of the Achenbach System of Empirically Based Assessment, from which he receives remuneration. All other authors report no financial interests or potential conflicts of interest.

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